

SUMBANDILASAT

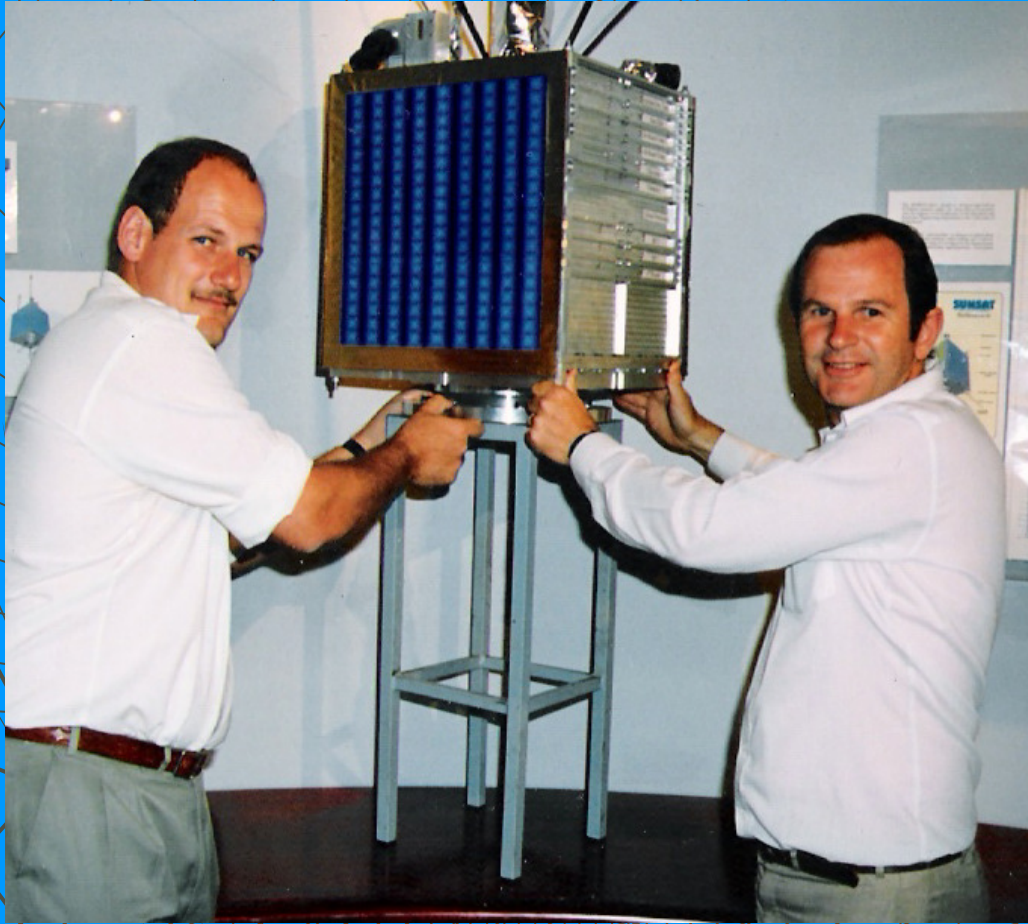
“Another SunSat”

2008 AMSAT-NA Symposium

AMSAT NA SPACE SYMPOSIUM



Take a step back

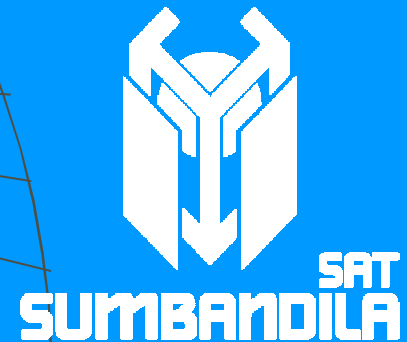


- ◆ Garth Milne pioneered SunSat OSCAR 35
- ◆ He paved the way for SumbandilaSat to carry an amateur radio payload
- ◆ He witnessed the construction but became a silent key before being able to experience the launch

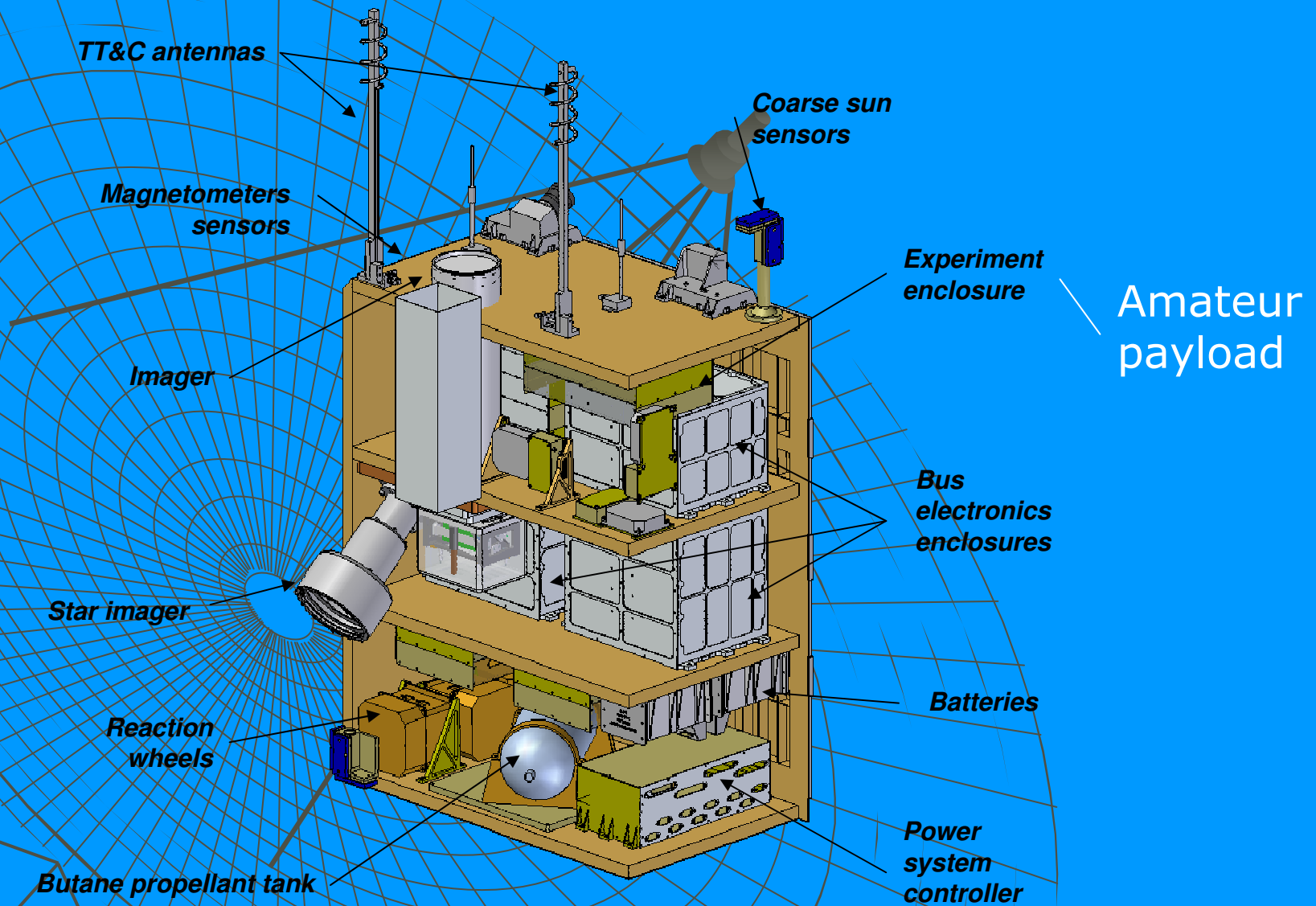
Sias Mostert and Garth Milne (right)

SumbandilaSat

- ◆ SumbandilaSat is a LEO satellite
- ◆ Its main payload is a remote sensing camera
- ◆ The other missions are the experimental payloads including amateur radio



Satellite Layout



Primary Payload

The main payload of Sumbandila Sat is a Multi-spectral imager which has a 6.25m Ground Sampling Distance (GSD) with 6 spectral bands and is supported by an on-board storage of 6 Gigabyte, with a redundant 18 Gigabyte spare.



SUMBANDILA EXPERIMENTAL PAYLOADS

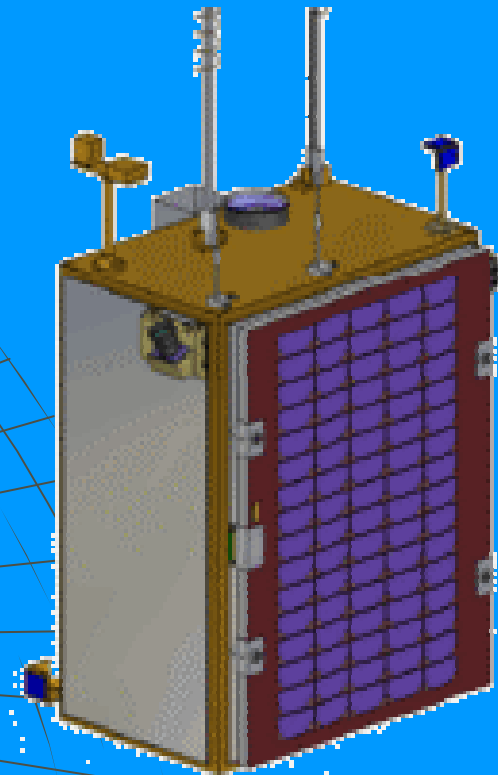
Experimental payloads

- ◆ **University of KwaZulu-Natal**
 - Very low frequency radio waves
- ◆ **Nelson Mandela Metro University**
 - Forced vibrating string
- ◆ **Stellenbosch University**
 - Software defined radio
 - Radiation experiment
- ◆ **SAAMSAT**
 - Radio Amateur transponder

SA AMSAT Payload

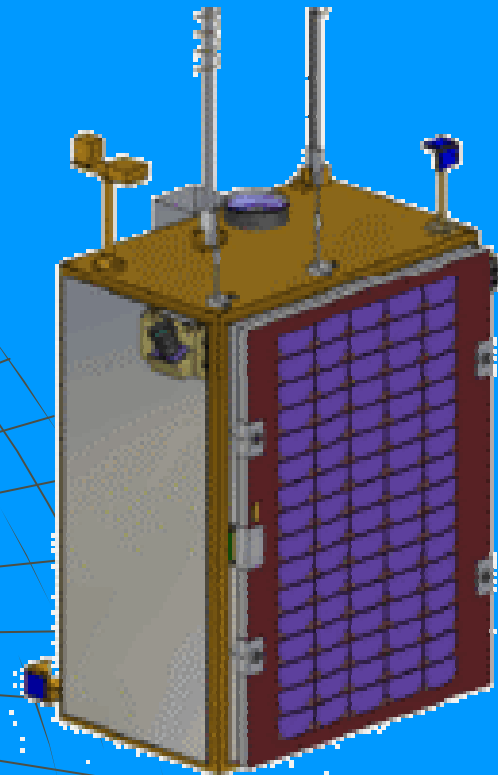
Objectives

- ◆ To promote an interest in SET amongst young people through their hands on involvement
- ◆ Create interest in satellite communication amongst the general amateur population

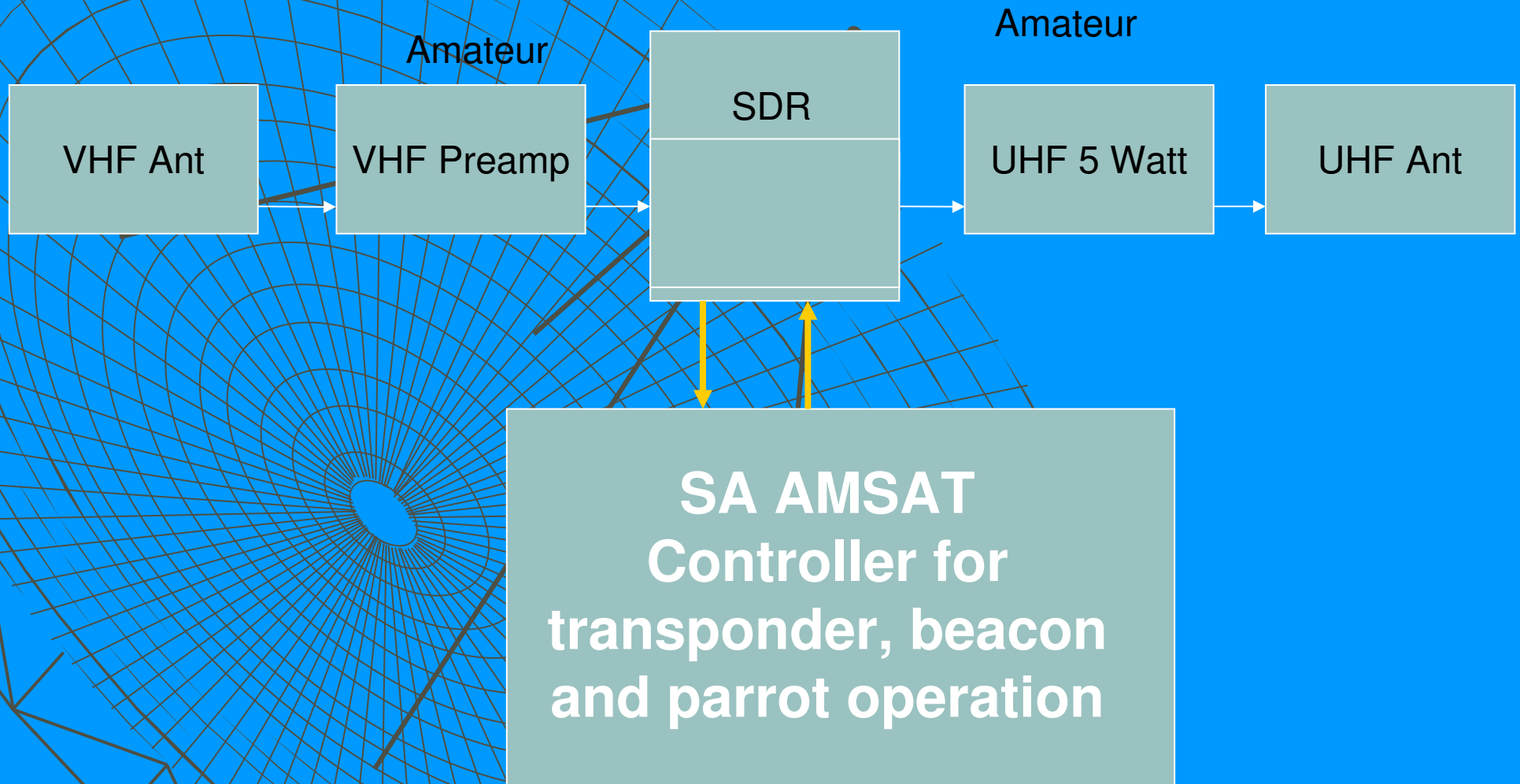


Payload Modes

- ◆ **Mode V/U FM transponder (the old mode J)**
 - 2m Uplink
 - 70cm Downlink
- ◆ **Parrot repeater**
 - 20 seconds of audio
- ◆ **Audio Beacon**

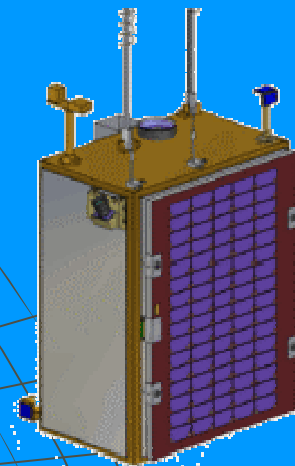


Systems



Operation

- ◆ On receipt of a “X” CTCSS tone the unit will command the satellite in the transponder mode
- ◆ On receipt of a “Y” CTCSS tone the control unit will command the satellite in the parrot mode
- ◆ If for a period no tones are received, the system will activate a voice beacon



Constructing Prototype

- ◆ Design: Andrew Roos ZS6AAA
- ◆ Prototyping: Hannes Coetzee ZS6BZP



Ground Station Requirements

- ◆ **A 2m/70cm 5 watt hand-held transceiver when the satellite is overhead**
- ◆ **For less ideal orbits an outside antenna such as ground planes or a two-band J-pole antenna is recommended. Transceiver power 10 – 20 watts**
- ◆ **For the ultimate results a beam with azimuth and elevation control**

Frequencies

Mode VU FM voice Transponder and Parrot

Uplink

145,880 MHz

Downlink

435,350 MHz

Ready in Clean room to go



Minister of Science and Technology and Hans van de Groenendaal ZS6AKV

Launch Saga

- ◆ Launch was scheduled on a Sthil rocket from a Russian submarine
- ◆ Delays and internal politics in Russia caused the launch to be scrubbed
- ◆ After protracted bilateral negotiations the Russian have offered a Baikonur launch
- ◆ Time Frame:
December 2008 – March 2009

Way Forward

- ◆ The SumbandilaSat is under going final testing at SunSpace
- ◆ Codes to operate the payload will be published after successful launch and payload commissioning
- ◆ Operating schedule: mainly weekend

Visit www.amasatsa.org.za for updates